Nesothrips Kirkaldy Supersedes Oedemothrips Bagnall

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In 1907, three years previous to the appearance of Bagnall's monograph of the Thysanoptera of the Hawaiian Islands, (Fauna Hawaiiensis, 3 (6) : 669-704, 1910) G. W. Kirkaldy erected the genera *Agnostochthona* and *Nesothrips,* each represented by a single species. The descriptions appeared together ("On Two Hawaiian Thysanoptera", G. W. Kirkaldy, Proc. Haw. Ent. Soc., 1 : 102) and constituted the first published reference to the Thysanoptera of these islands. They were later incorporated in Bagnall's monograph, but it was therein stated in the case of *Agnostochthona,* and implied in the case of *Nesothrips,* that Bagnall had not examined the type material on which the genera were founded. It was also indicated, at least by implication, that to Bagnall neither of the descriptions seemed adequate. How just that indication may have been in regard to *Agnostochthona* may never be ascertained, as Kirkaldy failed to state the disposition of his type material and with his passing it was lost to science. In regard to *Nesothrips,* the writer is now able to establish beyond question that Bagnall's distrust of Kirkaldy's description was entirely justified.

After being lost for many years the types of *Nesothrips* have again come to light. Some time before his death, the late E. M. Ehrhorn had informed the writer that years earlier he had mounted Kirkaldy's originally pinned specimens intending to study them, but that he had later misplaced the slide and had been unable to find it again; and now that slide, fully and plainly labelled, has been found. It was one of an accumulation of old slides which the courtesy of Noel Krauss of the Territorial Plant Quarantine Station has enabled the writer to examine. Consisting of a balsam mount of two specimens under the same cover, it is sufficiently clear to permit unmistakable identification of the specimens as a male and a female of the species which Bagnall (Fauna Haw., 3 (6) : 680) called *Oedemothrips laticeps* and upon which he erected the genus of the same name. Therefore, unjust as it must seem to anyone even carelessly glancing over Kirkaldy's description, the rules of taxonomy now demand the following revision:

Oedemothrips Bagnall 1910, becomes *Nesothrips* Kirkaldy, 1907.

Oedemothrips laticeps Bagnall 1910 becomes *Nesothrips hawaiiensis* Kirkaldy 1907.

The genus *Oedemothrips* or, by its new name, *Nesothrips,* is represented in our Territory only by the type species, and elsewhere only by the species *brevicollis* Bagnall in Japan, *propinquus* Bagnall in Australia, *propinquus* var. *brevipes* Bagnall in New Zealand, and *ceylonicus* Karny in Ceylon. Although not a genus of economic significance, the wide geographical distribution of its few species makes it one of interest. It does not seem superfluous, therefore, to present here a fuller description of the type species than has yet been accorded any of the others.

1907 *Nesothrips hawaiiensis* Kirkaldy. Proc. Haw. Ent. **1**: 103.

1910 *Oedemothrips laticeps* Bagnall. Fauna Hawaiiensis; **3** (6) : 680.

Female (apterous) : General color by transmitted light, dark brown to black; fore tibiae, all tarsi, base of third antennal segment, light translucent brown; a nearly black area showing on all tarsi near the distal end. Hypodermal pigment shows as red blotches through the transparent intersegmental membranes when these are stretched. Weak striation of the chitin is discernible only in caustic-treated specimens and is stronger on the sides of the head and disk of the metanotum than elsewhere. The pattern of striation is transversely reticulate.

Head 258 microns along mid-dorsal line from base to vertex; 273 microns wide just back of the eyes. Eyes together occupying one half of head width; separately, one fourth of head length along the margin. Sides converge weakly from eyes to slight collar-like thickening of chitin at base of head. Post-oculars long, not unusually thick, inserted well back from the eyes, slightly farther out from the mid dorsal line than the inner edge of the eyes. Interoculars somewhat longer than half the length of post-oculars, well in from the inner margin of the eyes on a line about a third of the eye length from their front margin. On the same line but very close to the eye margin another seta, very minute and difficult to observe but present in all specimens. Back of the post-oculars and nearer the mid-dorsal line, two other setae, much smaller than the interoculars but always conspicuous. Other small, possibly paired, setae on the cheeks cannot be accurately located on the dorso-ventral mounts available. The inner margin of the eyes in dorsal view is angularly rounded; the outer follows the outline of the head, not protruding and comprising about eight of the rather coarse facets, between which there is no pilosity. Ventrally the eyes are produced posteriorly and their outline is ellipsoidal, flattened at one end and constricted in the middle. The frons is produced into a flat rectangular plate which bears five pairs of setae: a very long pair forward, near the bases of the antennae, an equally long pair just above the base of the mouth cone, two minute and inconspicuous pairs between the latter and the transverse median line, and a somewhat longer pair above the median line and farther apart than the others. On each side of the frons, between the bases of the antennae and the eyes, there are two other paired setae, of which the upper one is the longer. The mouth cone is short, evenly rounded, reaching about two thirds of the way across the prosternum, bearing a pair of thin setae between the bases of the maxillary palpi. Maxillary palpi well developed, arising from shallow ovate depressions in which, semicircularly arranged, there are three or four setae with conspicuous bases; the basal segment short, about one fourth the length of distal segment, which tapers only slightly to a blunt tip armed with two or three thick, short, light-

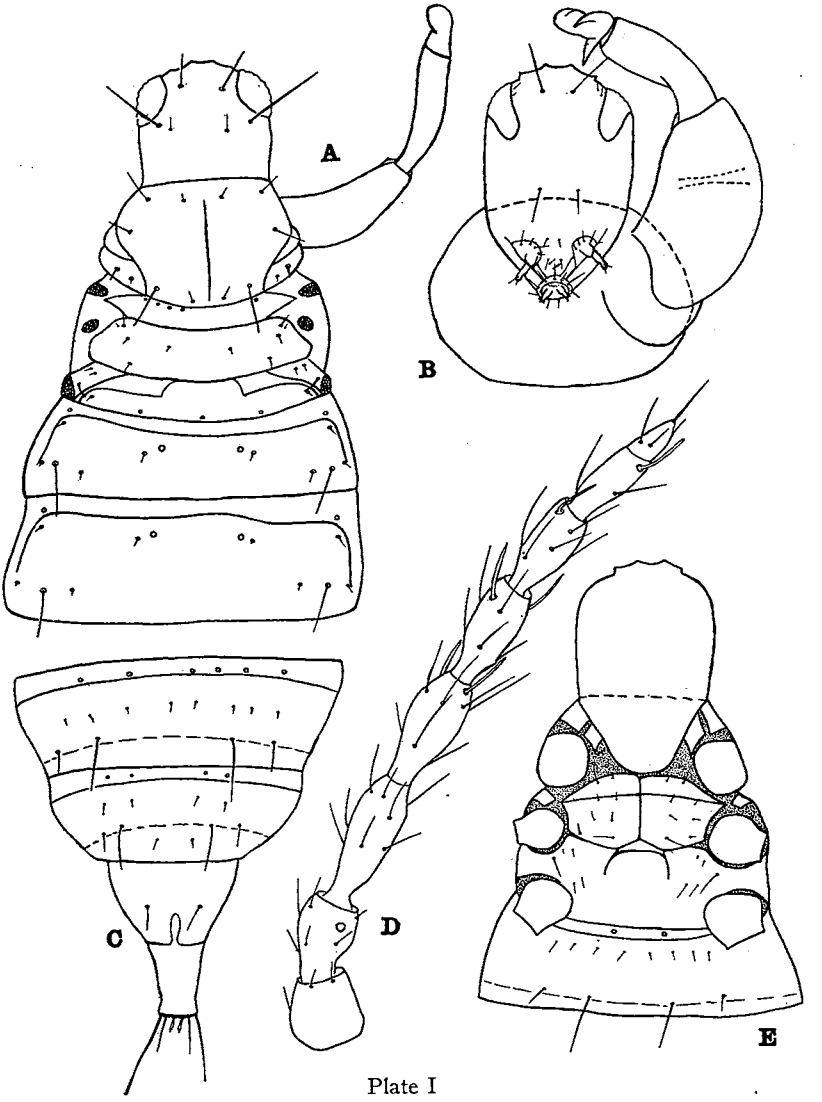

Plate I

Nesothrips hawaiiensis

A—Dorsal view of ♀, head, thorax, first and second abdominal segments.
B—Ventral view of ♂, showing mouth parts and location of transverse invagination of cuticle on dorsal surface of femur.
C—Ventral view of ♀, 7th, 8th, 9th and 10th abdominal segments.
D—Dorsal view of right antenna, ♀.
E—Ventral view of ♀, thorax and first abdominal segment. Setae of coxae and head not shown.

colored setae. The labrum, rather broadly tipped, does not protrude beyond the labium. The labial palpi are unusually small, irregularly cylindrical, armed with short setae; their segmentation not discernible. The distal edge of the labium is thick and curves around and behind the labial palpi and the tips of the labrum and maxillae, almost meeting in front and bearing six to eight long hairs which are regularly spaced and form a distinct circlet at the tip of the mouth cone.

Antennae eight segmented, approximate at base, twice as long as head, concolorous with body; by transmitted light segment three paler on basal third and showing dark transverse wrinkles; all segments except one bearing long, thin, translucent hairs arranged more or less in whorls, one below and the other above the transverse median line; segment one bearing no sense cone or sense pit and only one long hair on the inner side; segment two bearing a conspicuous sense pit dorsally near the distal margin; segment three bearing two sense cones ventrally; segment four, two dorsally; segment five, one on each side; segments six and seven, one dorsally; segment eight without sense pits or cones but with a long, thick hair at its tip. Sensory cones translucent, about half as long as segments bearing them, always borne near distal lip of segment, narrowing towards tip but not sharply pointed.

Prothorax 197 microns long; as wide as head in front; widening gradually to about middle, then smoothly rounded at hind angles to hind margin. Median suture dark, conspicuous, not reaching front or hind margin. Pronotal plate large, extending across prothorax in front, narrowing bisinuately towards the hind margin, making room at each hind angle for two other plates, the smaller of which is triangular and lies in front of the larger, which is trapezoidal and bears a thick short seta. Pronotal plate bears a long, strong seta at each hind angle; eight others, much smaller, as follows: four equally spaced on the fore margin, two on the hind margin, one on each side near the transverse median line. Also visible in dorsal view of the prothorax, there is on each side a short, thick, translucent bristle which is really inserted on the side of the fore coxa.

Prosternum chitinized only on shoulders and along caudal margin, a wide area of granulose membrane occupying the central portion, which is broadly indented to receive the mouth cone, and narrower bands curving about the bases of the fore coxae. A small, approximately rectangular sclerite occupies the front angle of the segment and a similarly shaped sclerite lies just inward from and slightly caudad of the first, their caudal margins forming a continuous curve in front of the coxa. Two sclerites joined along the midline to each other and along their straight caudal margins to the sclerites of the mesosternum form a plate that lies between the coxae and does not reach the disk of the segment; its front margin is arcuate and slightly indented on the midline where the two sclerites join and it bears four minute setae, two on each sclerite.

Pterothorax but little wider than prothorax and only 167 microns long; in mounted specimens appearing from dorsal view evenly outlined on sides, but probably not so in life, as the ventral plates of the segment are distinctly wider than the dorsal plates. Stigmata large and conspicuous; an elongate oval one placed dorso-ventrally on the fore angles of the mesothorax; a nearly circular one, dorsally on each side of the metathorax. Mesoscutum is short, sloping downward in front; its caudal margin straight and considerably shorter than the cephalic margin; its sides diverging anteriorly; bearing four exceedingly minute setae along posterior margin and a transverse row of five irregularly placed, circular pits near the transverse median line. Scutum and scutellum of metathorax fused without indication of suture; forming a roughly rectangular plate slightly wider and considerably longer than mesoscutum; its caudal and cephalic margins straight; its hind angles rounded; its front angles emarginate to fit around the metathoracic spiracles;

bearing two setae, one minute, on each end, above the spiracle, two longer ones on the hind margin, equidistant from the middorsal line, and a row of four minute ones on the transverse median line.

Mesosternum transversely rectangular; strongly curved on the sides to fit around middle coxae; weakly arcuate behind and the hind edge deeply and broadly invaginated in the center; curving sharply upwards along entire cephalic margin to join prosternum, which lies on a higher horizontal level than the rest of the ventral surface of the insect; divided into two side plates by a strong, straight median suture which is interrupted in back by the broad invagination of the caudal margin; each side plate bearing six small setae, two paired near the front margin, two on the median transverse line, and two, of which the inner is much longer than the outer, near the caudal margin. A small trapezoidal plate, the episternum, curves upwards on each anterior angle, just ahead of mesothoracic spiracle and is entirely separate from the mesosternum.

Metasternum transverse; considerably longer than mesosternum; weakly concave in front margin; almost straight caudally; narrowed and curving upwards on the sides between the middle and hind coxae; its front angles deeply excavate to curve around the middle coxae; its hind angles likewise curving around hind coxae; its front margin interrupted on either side of median line by a short, narrow, deep, longitudinal invagination of the chitinous disk of the segment; bearing on either, between the middle and hind coxae and almost on a median transverse line a long, strong seta, and inwards from this four much smaller ones, a pair cephalad and a pair caudad.

Legs in relation to size of body rather long but not unusually stout; the hind pair somewhat longer than the others; the front pair differing only in the relatively thicker femur; the coxae subconical, bearing several small setae but only the front pair with a conspicuous, thick, translucent seta on the outer side; the femora and tibiae bearing many dispersed, rather stiff setae which are generally longer on the distal third of the tibiae, and in addition a long thin, pale bristle outwardly on the distal end of the tibia and a similar one inwardly near the base of the femur. Tarsi two segmented; bearing several short, stiff, colorless setae; the division between segments oblique; the distal segment longer, with an almost black blotch on the ventral surface, bearing near the distal end, on what is the front surface as the insect walks, a strongly recurved claw which does not extend beyond the end of the segment.

Abdomen in relation to rest of body very large, in distended mounts twice as long as rest of body, elliptical in outline; of same width as pterothorax at base of first segment, widening rather suddenly to third segment, which is the widest and longest, narrowing gradually to fourth, thence more suddenly to base of tube. First abdominal segment shorter than metathorax, equally wide on front margin but considerably wider behind; its sides strongly convergent in front but parallel on their caudal halves, which are occupied by the upper portions of large spiracles placed dorso-ventrally on the sides of the segment; dorsally covered by three distinct plates, one roughly triangular occupying the base and central portion of the dorsum, two smaller ones, also triangular, occupying the anterior angles; the space between the chitinized plates occupied by a roughly granulose membrane; each side bearing three or four scattered, minute setae, and next to the spiracle a much stronger and conspicuous one; the central plate bearing a minute seta on each end near the hind margin and three equally spaced circular pits on a line joining the setae. Second segment is trapezoidal, with sides converging forward; three to six practically rectangular; seven, eight, and nine also trapezoidal but their sides strongly convergent caudally. On segments two to eight an area of heavier chitinization forms a plate which is broadly margined in front and back and narrowly margined on the sides by bands of weaker chitin that caudally merge into a broad granulose membrane. The cephalic margin of the plate is much more heavily chitin-

ized than the rest and appears in cleared specimens like a thin black line. The chaetotaxy of segments two to eight homologous, as follows: a small circular pit on each angle and one on each side of the mid-dorsal line, nearer to the cephalic than to the caudal margin of the segment; approximately in line with the latter but not always exactly so, four minute setae, two close to the circular pits and the other two near the side margins of the segment; on a transverse line cephalad about a third of the segment's length from the hind margin, six setae, three on each side, the inner minute in all the segments, the middle one relatively long in all the segments except eight, the outer one minute on segment two but gradually increasing until on segment seven it is the longest bristle on the body; on segment eight only the outer seta long, the two inner ones small. On segment nine the pits on the fore angles are not discernible in dorso-ventral mounts; the other two circular pits are larger and more widely spaced, being near the outer margins of the segment; of the three setae on each hind angle the middle one is small, the other two as heavy or heavier than the setae on segment seven but not as long. The eighth segment bears on the middle of each side a round spiracle, smaller than the thoracic ones and visible in dorso-ventral mounts only by deep focusing. The tube is characteristically stubby, about two-thirds the length of the head and about one half as wide at the end as it is at the base; the sides parallel on basal eighth, which is inserted in the ninth segment and visible only by transmitted light, then converging towards and roundly constricted just before the end; bearing on the caudal lip a circlet of six bristles longer than the tube and seven about half as long which alternate regularly on the dorsum and sides but not ventrally, where on either side of the dorso-ventral axis there is a shorter, characteristically sword-shaped seta.

The ventral arrangement of the abdominal segments is homologous from the first to the eighth. Each segment consists of a wide transverse band of chitin outlined in front by a thin black line of heavier chitinization, and margined narrowly in front and broadly behind by bands of coarsely granulose membrane. On the membrane in front is borne a row of circular pits; two on segment one, each flanked by a minute seta, six more or less regularly spaced on segments two to seven, four on segment eight. Near the cephalic margin of the chitinized band and reaching nearly from side to side is borne a transverse row of minute setae, from 8 to 12 on segments one to seven and only 4 on segment eight. On the caudal margin of the chitinized band is another row of four setae which are short and weak on segments one to five but become more than half as long as the segment on six to eight, the middle pair on these segments and on segment one being much longer than the outer. Unparalleled on the other segments, there are two minute setae on the caudal membrane of segment eight, one on either side of the midline. The caudal margin of segment nine is deeply, widely, bisinuately indented on the midline to form the genital opening, and on either side of the opening nearly on the transverse median line is a fairly long and strong seta.

Measurements of female holotype in mm., followed by measurements of metatype in parentheses, except in case of the setal measurements, which could not be obtained from the poorly mounted holotype and were all made on a metatype: Length about 2.35 (2.128); length of head .258 (.228); width across cheeks .273 (.228); median length of pronotum .197 (.182); greatest width of pronotum, including fore-coxae .410 (.334); median length of pterothorax .167 (.122); greatest width of pterothorax .516 (.410); greatest width of abdomen (segment III) .714 (.577); median length of tube .167 (.153); width of tube at base .105 (.091); width of tube at end .055 (.045); postocular setae .100; interocular setae .058; setae on anterior angles of prothorax .036; lateral setae on prothorax .048; outer setae on posterior angles of prothorax

.033; inner setae on posterior angles of prothorax .094; setae on 7th abdominal segment .183; setae on ninth abdominal segment .100; longest setae at end of tube .143.

Antennal segments	1	2	3	4	5	6	7	8	Total
Metatype	.0336	.0550	.0856	.0856	.0765	.0642	.0489	.0336	.483
Holotype	.0451	.0615	.1025	.0820	.0820	.0697	.0574	.0328	.533

Male (apterous): Not essentially different from the female except as follows: Somewhat smaller; length about 1.67 mm. (not distended). The prothorax is relatively longer and wider and its sides instead of converging forward are evenly rounded. The disk of the prosternum instead of being wholly membranous is occupied by two small thinly chitinized plates, more or less triangular in shape and separated from the two basal plates and from each other by thin sutures, from the fore-coxae and the shoulder pieces by narrow bands of granulose membrane. The fore-coxae occupy a relatively larger portion of the prosternum and their thick translucent setae are relatively smaller than in the female and not visible in dorsal view. The fore-femora are strongly incrassate; the chitin of their dorsal surface narrowly but deeply folded into a transverse invagination just distal of the median-transverse line. The caudal segment of the fore-tarsus is produced inwardly into a strong claw extending well beyond the margin of the fore-tibia. The ventral and dorsal chaetotaxy as in the female, but the structure of the ninth abdominal segment and the tube modified in the usual tubuliferan manner. Ventrally the discal portion of the ninth segment is joined to the base only, being more or less arcuately cut off from the sides into a scale which reaches farther back than the straight dorsal margin of the segment and overlaps the base of the tube. The base of the tube is straight dorsally but arcuately emarginated ventrally.

Measurements of male (metatype) in mm.: Length of head .258; width of head .243; length of prothorax .241; width of prothorax .425; width of fore-femur (transverse median line) .168; maximum width of abdomen (third segment) .562; width of tube at base .113; width of tube at end .045; length of tube .184; postocular setae .110; interocular setae .072; inner setae at posterior angles of prothorax .123; outer setae at posterior angles of prothorax .028; longest (outer) setae on the 7th segment .184; longest setae on the 8th segment .082; longest setae on the 9th segment .09; longest setae at end of tube .184.

Antennal segments	1	2	3	4	5	6	7	8	Total
	.0492	.0574	.0984	.0861	.0820	.0615	.0533	.0369	.524

Described from the following material which, to the author's knowledge, comprises all the collections ever made in the Territory, with the exception of Bagnall's:

1—The ♀ holotype: O. H. Swezey, collector; "probably on flowers"; Mt. Tantalus, Oahu; August 12, 1906; now in the collection of the Experiment Station, H.S.P.A.

2—The ♂ allotype: on the same slide as the holotype and with the same data.

3—One ♂: E. C. Zimmerman, collector; beating; Palikea, Waianae Mts., Oahu; November 2, 1936; in the Bishop Museum.

4—One ♀: N. H. Krauss, collector; beating; Waikolo valley region, Molokai; 3,500 ft. elevation; October, 1943; in the collection of the Pineapple Research Institute.